

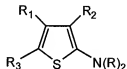
Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

Claims 1-3 (canceled)

4. (new) A thiophene monomer of the formula:



wherein:

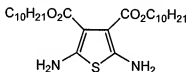
R is selected from the group consisting of H, Me and Et;

R₁ and R₂ are independently selected from the group consisting of H, CN, C₁-C₁₀ alkyl group and CO₂R₄;

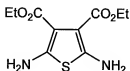
R₃ is selected from the group consisting of NH₂ and CHO; and

R₄ is a C₁-C₁₀ alkyl group.

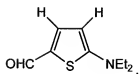
5. (new) The thiophene monomer of claim 4, having the formula:



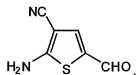
6. (new) The thiophene monomer of claim 4, having the formula:



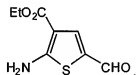
7. (new) The thiophene monomer of claim 4, having the formula:



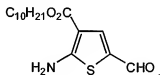
8. (new) The thiophene monomer of claim 4, having the formula:



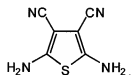
9. (new) The thiophene monomer of claim 4, having the formula:



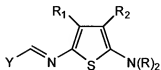
10. (new) The thiophene monomer of claim 4, having the formula:



11. (new) The thiophene monomer of claim 4, having the formula:



12. (new) A dimer of the formula:



wherein:

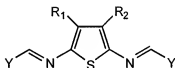
R is selected from the group consisting of H, Me and Et;

R₁ and R₂ are independently selected from the group consisting of H and CO₂R₄;

R₄ is a C₁-C₁₀ alkyl group; and

Y is selected from the group consisting of benzene, pyridine, pyridazine, pyrimidine, pyrazine, 1,2,3-triazine, 1,2,4-triazine, 1,3,5-triazine, thiophene, pyrrole, selenophene, tellurophene, 5-nitro-thiophene, 5-diethylamino-thiophene, 5-[2,2']-bithiophene and fluorene.

13. (new) A trimer of the formula:



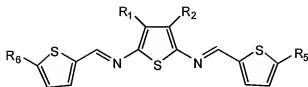
wherein:

R₁ and R₂ are independently selected from the group consisting of H, CN and CO₂R₄;

R₄ is a C₁-C₁₀ alkyl group; and

Y is selected from the group consisting of benzene, pyridine, pyridazine, pyrimidine, pyrazine, 1,2,3-triazine, 1,2,4-triazine, 1,3,5-triazine, thiophene, pyrrole, selenophene, tellurophene, 5-nitro-thiophene, 5-diethylamino-thiophene, 5-[2,2']-bithiophene and fluorene.

14. (new) The trimer of claim 13, having the formula:



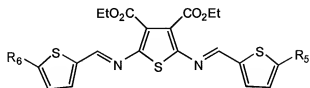
wherein:

R₁ and R₂ are independently selected from the group consisting of H and CO₂R₄;

R₄ is a C₁-C₁₀ alkyl group; and

R₅ and R₆ are independently selected from the group consisting of H, NO₂, NEt₂ and 2-thiophene.

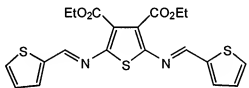
15. (new) The trimer of claim 14, having the formula:



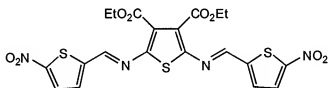
wherein:

R₅ and R₆ are independently selected from the group consisting of H, NO₂, NEt₂ and 2-thiophene.

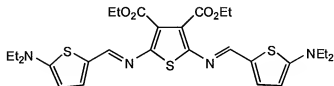
16. (new) The trimer of claim 15, having the formula:



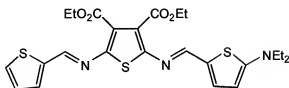
17. (new) The trimer of claim 15, having the formula:



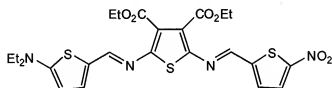
18. (new) The trimer of claim 15, having the formula:



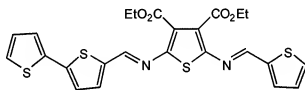
19. (new) The trimer of claim 15, having the formula:



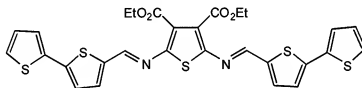
20. (new) The trimer of claim 15, having the formula:



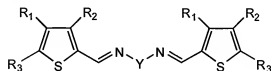
21. (new) The trimer of claim 15, having the formula:



22. (new) The trimer of claim 15, having the formula:



23. (new) A trimer of formula:



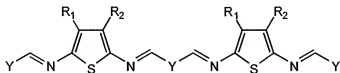
wherein:

R₁ and R₂ are independently selected from the group consisting of H and CO₂R₄;

R₄ is a C₁-C₁₀ alkyl group; and

Y is selected from the group consisting of benzene, pyridine, pyridazine, pyrimidine, pyrazine, thiophene, pyrrole, selenophene, tellurophene.

24. (new) An oligomer of formula:



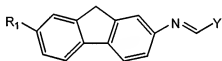
wherein:

R₁ and R₂ are independently selected from the group consisting of H and CO₂R₄;

R₄ is a C₁-C₁₀ alkyl group; and

Y is selected from the group consisting of benzene, pyridine, pyridazine, pyrimidine, pyrazine, thiophene, pyrrole, selenophene, tellurophene.

25. (new) A fluorene monomer of the formula:

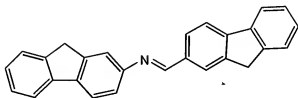


wherein:

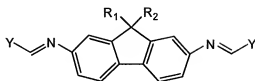
R₁ is selected from the group consisting of H and NH₂; and

Y is selected from the group consisting of benzene, pyridine, pyridazine, pyrimidine, pyrazine, thiophene, pyrrole, selenophene, tellurophene, fluorene, and 2-aminofluorene.

26. (new) The fluorene monomer of claim 25, having the formula:



27. (new) A fluorene monomer of the formula:

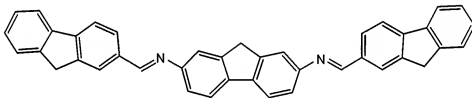


wherein:

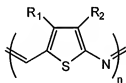
R_1 and R_2 are independently selected from the group consisting of H and C_1 - C_{10} alkyl group; and

Y is selected from the group consisting of benzene, pyridine, pyridazine, pyrimidine, pyrazine, thiophene, pyrrole, selenophene, tellurophene, fluorene, 2-aminofluorene, and 5-carboxaldehyde-thiophene.

28. (new) The fluorene monomer of claim 27, having the formula:



29. (new) An electrically conducting polymer based on a repeating thiophene monomer as defined in claim 4, the polymer comprising the formula:



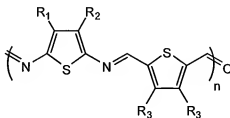
wherein:

R_1 and R_2 are independently selected from the group consisting of H, CN, C_1 - C_{10} alkyl group and CO_2R_4 ;

R_4 is a C_1 - C_{10} alkyl group; and

n is an integer ranging from 4 to 50 000.

30. (new) The electrically conducting polymer of claim 29, wherein said polymer is treated with a doping agent.
31. (new) The electrically conducting polymer of claim 30, wherein said doping agent is selected from the group consisting of a p-type dopant and an n-type dopant.
32. (new) The electrically conducting polymer of claim 31, wherein said p-type dopant is selected from the group consisting of chlorine, bromine, iodine, AlCl_3 , FeCl_3 , GaCl_3 , $\text{CF}_3\text{CO}_2\text{H}$, HCl , H_2SO_4 , $\text{CH}_3\text{SO}_3\text{H}$.
33. (new) The electrically conducting polymer of claim 32, wherein said n-type dopant is selected from the group consisting of sodium naphthalide, SbF_5 , AsF_5 , PF_5 , AgX , NO_2X , and NOX .
34. (new) The electrically conducting polymer of claim 33, wherein X is a non-nucleophilic anion.
35. (new) The electrically conducting polymer of claim 34, wherein the non-nucleophilic anion is selected from the group consisting of BF_4^- , PF_6^- , SbF_6^- , ClO_4^- , sulfonic acid anions and carboxylic acid anions.
36. (new) An electrically conducting polymer of the formula:



wherein:

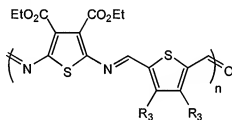
R₁ and R₂ are independently selected from the group consisting of H, CN, C₁-C₁₀ alkyl group and CO₂R₄;

R₃ is selected from the group consisting of H and C₁-C₁₀ alkyl group;

R₄ is a C₁-C₁₀ alkyl group; and

n is an integer ranging from 4 to 50 000.

37. (new) The electrically conducting polymer of claim 36, having the formula:

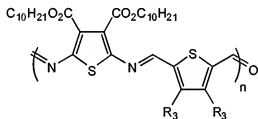


wherein:

R₃ is selected from the group consisting of H and C₁-C₁₀ alkyl group; and

n is an integer ranging from 4 to 50 000.

38. (new) The electrically conducting polymer of claim 36, having the formula:

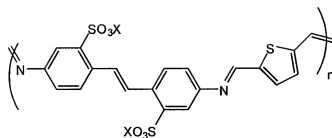


wherein:

R₃ is selected from the group consisting of H and C₁-C₁₀ alkyl group; and

n is an integer ranging from 4 to 50 000.

39. (new) An electrically conducting polymer of the formula:

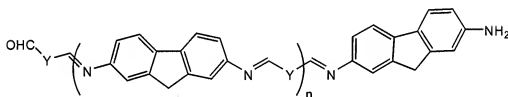


wherein:

X is selected from the group consisting of Na, K and Et₃NH; and

n is an integer ranging from 4 to 50 000.

40. (new) An electrically conducting polymer of the formula:



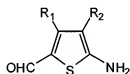
wherein:

Y is selected from the group consisting of benzene, pyridine, pyridazine, pyrimidine, pyrazine, thiophene, pyrrole, selenophene, tellurophene, fluorene; and

n is an integer ranging from 4 to 50 000.

41. (new) Use of an electrically conducting polymer as defined in claim 29, in applications selected from the group consisting of organic light emitting diodes (OLEDs), polymer light emitting diodes, conducting wires, thin films and active matrices.
42. (new) Use of an electrically conducting polymer as defined in claim 29, in applications selected from the group consisting of microdisplays, laptop computers, televisions, computer monitors, stereos, cellular telephones, displays, fuel cells, battery storage devices, photovoltaic cells, solar cells, liquid crystal devices, optical devices, sensors and detectors.

43. (new) An organic light emitting diode comprising an electrically conducting polymer as defined in claim 29.
44. (new) A polymer light emitting diode comprising an electrically conducting polymer as defined in claim 29.
45. (new) A molecular wire comprising an electrically conducting polymer as defined in claim 29.
46. (new) A thin film comprising an electrically conducting polymer as defined in claim 29.
47. (new) An active matrix comprising an electrically conducting polymer as defined in claim 29.
48. (new) A method for preparing an electrically conducting polymer as defined in claim 29, comprising polymerizing a thiophene monomer of the formula:

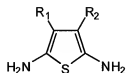


wherein:

R₁ and R₂ are independently selected from the group consisting of H, CN, C₁-C₁₀ alkyl group and CO₂R₄; and

R₄ is a C₁-C₁₀ alkyl group.

49. (new) A method for preparing an electrically conducting polymer as defined in claim 36, comprising reacting a thiophene diamine of the formula:

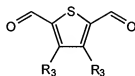


wherein:

R₁ and R₂ are independently selected from the group consisting of H, CN, C₁-C₁₀ alkyl group and CO₂R₄; and

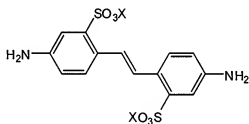
R₄ is a C₁-C₁₀ alkyl group,

with an aromatic dialdehyde of the formula:



wherein R₃ is selected from the group consisting of H and C₁-C₁₀ alkyl group.

50. (new) A method for preparing an electrically conducting polymer as defined in claim 39, comprising reacting an aromatic diamine of the formula:

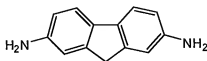


wherein

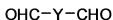
X is selected from the group consisting of Na, K and Et₃NH;

with 2,5-thiophene dicarboxaldehyde.

51. (new) A method for preparing an electrically conducting polymer as defined in claim 40, comprising reacting 2,7-diaminofluorene



with an aromatic dialdehyde of the formula:



wherein Y is selected from the group consisting of benzene, pyridine, pyridazine, pyrimidine, pyrazine, thiophene, pyrrole, selenophene, tellurophene and fluorene.